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EXAMINER

DO, ANH HONG

ART UNIT	PAPER NUMBER
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2624

DATE MAILED: 05/20/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.
09/448,940

Applicant(s)
Barnes et al.

Examiner
Anh Hong Do

Art Unit
2624



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Feb 28, 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 6) ☐ Other:

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DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 2/28/2003 have been fully considered but they are not persuasive.

* With respect to claim 1, the Applicant contends that the reference fails to disclose “compiling and storing.... to lossless compressed data” and “applying at least first and second... to subregions”. However, Hirabayashi clearly discloses compiling 6 optimum Huffman tables for respective block sizes (col. 7, lines 38-40) and storing these tables as reference information to be used in the final encoding (col. 7, lines 52-57), wherein Huffman coding is a lossless coding. Furthermore, Hirabayashi also discloses applying at least two compression tables from the stored plurality of compression tables (i.e., the stored optimum Huffman tables, as disclosed in col. 7, lines 52-75) to pixel blocks of uncompressed data stream to compress/encode the pixel blocks (col. 8, lines 1-4, teaches applying Human tables for blocks of pixels).

* Regarding claim 24, the Applicant asserts that the reference does not disclose “compressing subregions of the image data stream by application of a plurality of compression code tables”. It should be noted Hirabayashi clearly discloses compressing the image data stream with the stored optimum Huffman **tables** (col. 7, lines 52-57), not *a single Huffman table* as alleged by the Applicant.

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* With respect to claims 18-23, the Applicant contends the reference fails to disclose “a data compression station configured to store a plurality of compression code tables for conversion of image data to lossless compressed image data” and “optimal lossless compression of the subregion”. In contrast, Fig. 2 in Puri clearly shows variable length code table for DCT events 210 and variable length code tables for overhead 225 stored in variable length encoder station 190. In fact, the DCT events are video data inputted on bus 100 to subtractor 105 and transformed by transform encoder 120 (Fig. 1). Furthermore, Puri also discloses optimal lossless compression of the subregions using variable length encoder 190 (Fig. 1), the encoded data is transmitted to the variable decoder 410 and then to the transform decoder 430 to output transformed decoded data, which is then added to the error data by the adder 485 to output the reconstructed data which is exactly the same as the input data (see Fig. 4).

* Regarding claims 12 and 2-11, the Applicant contends that the combined references fail to disclose “storing the compression code tables in an image data compression station and in an image data decompression station”. In contrast to the Applicant’s contention, Puri clearly shows variable length code table for DCT events 210 and variable length code tables for overhead 225 stored in variable length encoder station 190 (Fig. 2) and variable length code tables for overhead 510 and variable length code table for DCT events 525 stored in the image data decompression station 410 (Fig. 5). Furthermore, the motivation for combining the two references is to map a prediction error in Hirabayashi as taught by Puri in order to increase the coding efficiency.

For the foregoing reasons, it is believed the rejections should be sustained.

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Claim Rejections - 35 U.S.C. § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1 and 24-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Hirabayashi et al. (U.S. Patent No. 6,101,282).

Regarding claim 1, Hirabayashi discloses:

(a) compiling a plurality of encoding/compressing tables for converting unencoded/uncompressed data representative of individual picture elements to encoded/compressed data (col. 7, lines 38-40: compiling 6 Human tables);

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(b) applying at least two compression tables from the plurality of compression tables to pixel blocks of uncompressed data stream to compress/encode the pixel blocks (col. 8, lines 1-4, teaches applying Human tables for blocks of pixels);

- appending data for the compressed/encoded blocks to form a compressed/encoded data stream (col. 8, lines 13-16, teaches generating a train of encoded data).

Regarding claim 24, Hirabayashi discloses:

- a machine readable medium (Fig. 11: CPU1; and col. 9, lines 1-3);

- configuration code stored on the machine readable medium, the configuration code including an algorithm for analyzing an image data stream (Fig. 11: difference value generation circuits 102 and 103), for compressing/encoding subregions of the image data stream (Fig. 11: encoder 104) by application of a plurality of compression code tables (col. 9, lines 27-30), and for compiling the compressed/encoded subregions into a compressed/encoded data file (Fig. 11: encode generator 110).

Regarding claim 25, Hirabayashi teaches storing a family of candidate compression code tables on the machine readable medium (Fig. 11: RAM 3).

Regarding claim 26, Hirabayashi teaches the algorithm including computation of the compressed/encoded data lengths provided by application of a plurality of candidate compression code tables for compression of each subregions (Fig. 11: difference value generation circuits 102 and 103, and encode generator 110), and selection of the compression code tables providing the

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shortest compressed data lengths for each subregion (Fig. 11: selector 108; and col. 9, lines 45-47).

Regarding claim 27, Hirabayashi teaches the code is installed on the machine readable medium via a configuration network link (col. 1, lines 6-15).

4. Claims 18-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Puri (U.S. Patent No. 5,563,593).

Regarding claims 18 and 19, Puri discloses:

- a data compression/encoding station configured to store a plurality of compression code/encoding tables for conversion of image data to compressed/encoded image data (Fig. 7: MPEG-1 VLC table for DCT events 710 and intra VLC table for DCT events 715 in image data encoding station) and to execute a compression/encoding routine in which an image data stream is converted to a compressed/encoded file by dividing into subregions and each subregion compressing in accordance with a compression code/encoding table selected from the plurality of compression code/encoding tables (Fig. 9: encoder for DCT events 915 for conversion, where DCT is representative of block of pixels, formed by dividing the image data stream, as disclosed in col. 1, lines 13-16) based upon which compression code table provides optimal compression/encoding of the subregion (col. 6, lines 13-17);

- a data storage for receiving and storing the compressed/encoded file (col. 7, lines 32-35);
- an image decompression/decoding station configured to store a plurality of compression code/encoding tables (Fig. 8: MPEG-1 VLC table for DCT events 810 and intra VLC table for

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DCT events 815 in image data decoding station), to access the compressed/encoded file from the data storage and to execute a decompression/decoding routine in which the compression code/encoding tables applied to compress/encode the image data stream are applied to decompress/decode the compressed/encoded file to reconstruct the image data stream (Fig. 10: decoder 1040).

Regarding claims 20-22, Puri teaches analysis of the image data stream for data representative of an identification of an image encoded by the image data stream (col. 7, lines 24-51).

Regarding claim 23, Puri teaches encoding of identifiers of the selected compression code tables within the compressed/encoded file (Fig. 9: encoder 915), and the analysis of the identifiers for selection of the same compression code tables for decompression of the compressed/encoded file (col. 8, lines 22-26).

Claim Rejections - 35 U.S.C. § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 2-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirabayashi et al. (U.S. Patent No. 6,101,282) in view of Puri (U.S. Patent No. 5,563,593).

Regarding claims 2-4, although disclosing as in claim 1, Hirabayashi does not specifically teach using the compression tables to map a prediction error as claimed. One skilled in the art would have clearly recognized that the encoding system of Hirabayashi is to enable more efficient encoding in the unit of blocks.

Puri, in the same field of endeavor, teaches using compression/encoding tables to map a prediction error generated by subtractor 902 for each pixel on bus 903 to a compressed/encoded data code on bus 917 (Fig. 9), wherein the system of Puri is to increase the efficiency of coding (col. 2, lines 1-6). Therefore, it would have been obvious to use compression/encoding tables to map a prediction error in Hirabayashi as taught by Puri in order to increase the coding efficiency.

Regarding claim 5, Puri teaches selecting the compression/encoding tables from the plurality of compression/encoding tables using selector 920 (Fig. 9).

Regarding claims 6 and 7, Puri teaches the compression/encoding table are selected based upon relative entropy levels of each pixel blocks (col. 7, lines 18-24).

Regarding claim 8, Puri teaches application of subtractor 902 to determine a difference between a predicted value of each pixel on bus 958 and the actual value of the respective pixel on bus 901 (Fig. 9).

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Regarding claims 9 and 10, Puri teaches selecting the compression/encoding tables based upon which tables provide the shortest compressed/encoded data stream for each pixel block (col. 6, lines 13-17).

Regarding claim 11, Puri teaches encoding in the compressed image data stream identifier representative of the compression/encoding tables (Fig. 9: variable length encoder for overhead and bitstream formatter 990).

Regarding claim 12, Hirabayashi discloses:

(a) and (b) defining and storing a family of candidate compression code tables on the machine readable medium (Fig. 11: RAM 3).

Hirabayashi does not specifically teach the following subject matters as does Puri:

(b) storing the compression/encoding tables in an image data compression/encoding station (Fig. 7: MPEG-1 VLC table for DCT events 710 and intra VLC table for DCT events 715 in image data encoding station) and in image data decompression/decoding station (Fig. 8: MPEG-1 VLC table for DCT events 810 and intra VLC table for DCT events 815 in image data decoding station);

(c) selecting at least two of the compression code tables for compression/encoding of DCT (corresponding to pixel blocks or subregions) of an image data stream (Fig. 7: selector 700);

(d) compressing/encoding the image data stream in accordance with the selected compression code tables at the compression/encoding station for decompression/decoding at the decompression/decoding station (Fig. 9: encoder 915 for encoding the image data stream in

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accordance with the compression/encoding tables selected by selector 920 for decoding it at the decoding station shown in Fig. 10).

The motivation is set forth in the discussion of claims 2-4 above.

Regarding claim 13, Puri teaches encoding in the compressed image data stream identifier representative of the compression/encoding tables (Fig. 9: variable length encoder for overhead and bitstream formatter 990).

Regarding claim 14, Puri teaches the compression/encoding tables are defined based upon analysis of typical images to be compressed/encoded at the compression/encoding station (Fig. 7: define VLC tables for DCT events based upon MPEG-1 and intra images).

Regarding claim 15, Puri teaches application of subtractor 902 to determine a difference between a predicted value of each pixel on bus 958 and the actual value of the respective pixel on bus 901, and wherein the compression/encoding tables are applied to encode the difference values (Fig. 9).

Regarding claims 16 and 17, Puri teaches selecting the compression/encoding tables based upon which tables provide the shortest compressed/encoded data stream for each pixel block (col. 6, lines 13-17).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh Hong Do whose telephone number is (703) 308-6720.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-4700 or 4750.

The fax phone number for this Group is (703) 872-9314.

May 17, 2003.

A handwritten signature in black ink, appearing to be 'H. Hong Do', is located at the bottom left of the page.